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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,664	01/12/2004	Todd P. Lukanc	H1700	9311

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EXAMINER	
YOUNG, CHRISTOPHER G	
ART UNIT	**PAPER NUMBER**
1756	

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/755,664	LUKANC ET AL.	
	Examiner	Art Unit	
	Christopher G. Young	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2004 and 29 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 17-23* is/are rejected.

7)☒ Claim(s) *8-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1 sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-5 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Burm et al. (US Patent Number 6,139,995).

The invention as claimed is described, taught and suggested by the prior art reference. Specifically refer to claim 7 which recites: A method for the manufacture of a Schottky gate transistor comprising the steps of: forming a source and drain in a III-V

semiconductor substrate, and forming a Schottky gate on the surface of said III-V semiconductor between said source and drain the invention characterized in that said Schottky gate is formed by the steps comprising: a. depositing a layer of photoresist on the surface of said substrate, said layer of photoresist having a thickness t.sub.1 +t.sub.2, b. exposing a first thickness t.sub.1 of said layer of photoresist using a first photomask with a first photolithographic pattern having a rectangular shape with width w.sub.1 and length l.sub.1, with the length dimension extending along the direction separating the source and drain, said first photolithographic pattern further having at a first set of alignment marks, thereby forming a latent image of said first set of alignment marks in said first level of photoresist, c. aligning a second photomask to said substrate by registering a second set of alignment marks on said second photomask with said latent image of said first set of alignment marks, d. exposing a second thickness t.sub.2 of said layer of photoresist using a pattern having a rectangular shape with width w.sub.2 and length l.sub.2, and further where length l.sub.2 is greater than length l.sub.1, e. developing said layer of photoresist to produce a T-shaped feature, f. depositing a metal layer to fill a portion of said T-shaped feature, said metal layer having a thickness h.sub.1 +h.sub.2, where h.sub.1 is essentially equal to t.sub.1 and h.sub.2 is substantially less than t.sub.2, and g. dissolving away said layer of photoresist leaving a T-shaped Schottky gate.

3. Claims 1-7 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al. (US Patent Application Publication 2003/0064307).

The claimed invention is described, taught, and suggested by the prior art reference. The specification teaches that installed between the illumination optical system 11 and the reticle stage 20 are reticle alignment systems (RA systems) 25a, 25b of the image capturing system for observing the reticle alignment marks RM formed on the reticle 12. The RA systems 25 are used mainly for detecting positional information of the reticle alignment marks RM which are used during the reticle alignment operation where the center of the reticle 12 is aligned with the center of the projection optical system 13. The RA systems 25 are also capable of observing the reticle alignment marks RM and the alignment mark WM (FIG. 5) formed on the substrate 1. An image signal from an image pickup device (not shown) installed inside the RA systems 25 is supplied to the main control system 30.

Now the second embodiment of the latent image forming method according to the present invention will be described below, which is a method of forming the image of a pattern formed on a master plate on the substrate through a change in the color of a predetermined substance, included in the resist that changes color according to irradiation with the exposure light.

For the substances that change color when irradiated with light, a group of substances generally referred to as photochromic compounds are known. Photochromic compounds change color when irradiated with light and return to their original color in a dark place, and are roughly classified into inorganic substances and organic substances. Examples of inorganic substances include silver halide and

tungsten oxide. Examples of organic substances include substances such as viologen, spiropyran, spirooxazine, diaryl ether and fulgide.

The light source of the exposure apparatus is used for forming the latent image, and light of various wavelengths may be used such as the g line (436 nm), the i line (365 nm), the light of a KrF excimer laser (248 nm), the light of an ArF excimer laser (193 nm), the light of a F.sub.2 laser (157 nm) or X rays.

The integrated light intensity irradiated for forming the latent image may be similar to that of the exposure conditions used in the manufacture of semiconductor devices, or may be slightly higher. When a higher cumulative light energy is applied, a higher contrast of the latent image (alignment mark) is obtained and the alignment accuracy is improved. When a KrF excimer laser is used in forming the latent image, for example, an integrated light intensity of about 10 to 1000 mJ/cm.sup.2 is preferable.

The latent image (alignment mark) can be detected efficiently by using the alignment optical system of the exposure apparatus of the prior art that employs light of wavelength in a range from 400 nm to 800 nm or light (633 nm) from a He--Ne laser, similarly to the first embodiment.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US Patent Application Publication 2003/0064307).

The scope of the prior art is set forth in paragraph number 3 above and is incorporated by reference. Claims 18-23 are drawn to fabrication of a hard mask for subsequent processing of the substrate. Although the reference does not specifically teach this aspect, one of skill in the art would have found it prima facie obvious in view of the teachings of the reference, in combination with well known art related processing steps, to utilize the method taught in the prior art as a formation method for creation of a hard mask. Utilizing this process is the next logical step for the method of the prior art.

Allowable Subject Matter

6. Claims 8-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher G. Young whose telephone number is 571-272-1394. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christopher G. Young
Primary Examiner
Art Unit 1756

cgy